

Issue 4

Summer 2010

# KENTUCKY DEPARTMENT FOR NATURAL RESOURCES

## Natural Resources Review

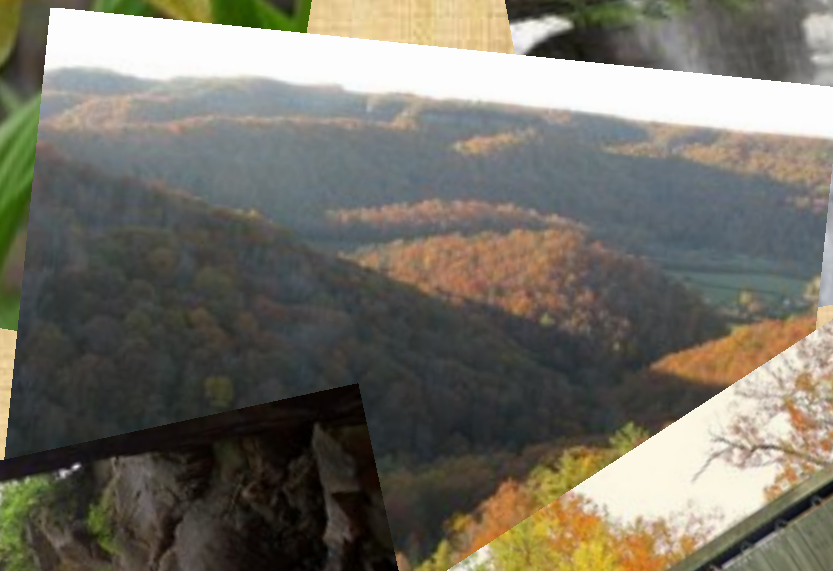


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### OUR MISION STATEMENT

The department, through its divisions and partnerships, provides technical assistance, education and funding to help landowners, institutions, industries, and communities in conserving and sustaining Kentucky's natural resources. In addition, the department inspects timber harvests and mining operations to ensure the protection of our citizens, our environment, and our workers.



## Commissioner's Corner

**By Carl E. Campbell, Commissioner  
Department for Natural Resources**

Dear Colleagues,

As the Commonwealth's budget woes continue, it appears to me that one of the answers to our nation's economic recovery lies within the area of natural resources. I have spent a lifetime working and observing many indicators that point to the fact that preserving and properly utilizing our natural resources not only reduces green-house gases, but generates jobs and stimulates economic growth in our country.

The U.S. Secretary of Energy recently said that "Coal is likely to be a major and growing source of electricity for the foreseeable future." The Energy Information Administration says, "An additional 21,000 megawatts of coal based electricity capacity will be needed by the year 2030." Given these informed assessments, the outlook of continued employment seems to be good for the coal communities in the next 20 years. The rest of us in Kentucky will continue to enjoy the residual benefits of coal mining in Kentucky, including the low cost of our electricity compared to other parts of the country. We will continue to regulate this important industry in a manner that protects the workers, the environment, and the public at large, while supporting those companies that provide critical jobs for the Commonwealth.

Interestingly, these projections of increased electricity are made while taking into account the increasing requirements for carbon capture, CO<sub>2</sub> injection, and clean coal technologies, along with advancements in other alternative fuel usage. These innovative technologies are being encouraged by the federal government and in some cases significantly supported by federal funds. The Obama administration has made it a top priority, committing over a billion dollars to clean coal technology. Kentuckians will be employed in the construction of, and the continued operation of those facilities and new opportunities will be provided to our young people going into those fields of engineering, science, and management.

Alternative fuels offer the opportunity to make our Commonwealth a vibrant marketplace. Increasing the use of wood products to generate electricity will require the involvement of more landowners and workers in that industry. Harnessing the power of wind will prove useful in some areas of our state and our farmers will grow more grain, corn, grasses, and trees that will be utilized for the production of fuel and electricity.

Nationally, it is projected that several hundred thousand additional jobs will be created in the many industries mentioned above, and I believe that rural states such as ours will be affected the most. Kentucky has 12 million acres of forest, 14 million acres of farmland, and over 17,000 jobs in the coalfields of eastern and western Kentucky. It will be imperative for our Department to lead the efforts in preserving and conserving our natural resources, while cooperating with these industries that are important to all Kentuckians and our nation. We will continue to ensure the safety of the people, while protecting the land, air, and water from being adversely affected by these future developments.

### Did You Know ?

- The Kentucky Abandoned Mine Lands (AML) Program has expended to date approximately \$76,638,708.00. To restore lands unregulated or “pre-law” coal mining and provide useable water to thousands of Kentuckians where water sources were damaged by mining.
- The Office of Mine Safety and Licensing has seen a steady increase in the number of mines receiving licenses this year which is an excellent indicator of the demand for increased coal production. Since February 15th Kentucky has gained 64 new or reopened mines (15 underground mines & 49 surface mines). The total number of mines actively operating as of May 21<sup>st</sup> is: Surface-206; Underground-174; Total-380. New surface mines increased by 31% while underground mines saw an increase of 9% since 2/15/10. Overall, new licensed mines have increased by 20% in the last three months.
- The Division of Mine Permits has made remarkable improvement in reducing the number of delinquent mine permits with the numbers reflecting a consistent downward trend for the past five months. This is an extraordinary turnaround from the persistent negative feedback that was surrounding this issue a short time ago. The leadership and staff of this division have earned our appreciation for their continuing dedication and focus on eliminating the backlog.



## Kentucky and Virginia Partner in First Interstate Arbor Day Celebration

*Elementary students from both states plant tree seedlings to create a "forest without borders"*

On April 30, 2010, 100 students and their teachers from Arlie Boggs Elementary in Letcher County, Kentucky and Appalachia Elementary in Wise County, Virginia planted over 1,000 native hardwood seedlings and wetland plants to promote reforestation and wetland creation on mined lands. The event was hosted by the Cumberland River Coal Company on its surface mining operation located on the Kentucky-Virginia state line. Representatives from the Kentucky Energy and Environment Cabinet, the U. S. Office of Surface Mining, the Kentucky Department for Natural Resources (DNR), the Virginia Department of Mines, Minerals and Energy and the Appalachian Regional Reforestation Initiative organized and participated in the event.

Tree species planted included blight resistant American chestnut, red oak, black walnut, yellow poplar, green ash and red maple. The seedlings are grown at the Kentucky Division of Forestry state nurseries. Mini-workshops led by Tom Biebighauser of the U.S. Forest Service focused on establishing forested wetlands and provided participants an introduction in creating wetlands on mined lands. Reforestation of previously mined lands has been encouraged in Kentucky since DNR and the University of Kentucky began researching its viability in 1996. Loose soil prepared according to specific guidelines, the Forestry Reclamation Approach (FRA), has resulted in greater tree growth, both in height and survival rates, than many virgin forest soils. Planting native hardwoods provides landowners with a sustainable source of income, improves water quality and offers habitat for forest animals.



Wetlands construction is a new partnership with DNR and the U.S. Forest service, which promises to complement the reforestation initiative by interspersing wetland areas in the forest. Water fowl, dragonflies and salamanders gravitate to the wetlands providing yet another natural feature to the previously mined lands.

Excitement, enthusiasm and energy from the students combined with a glorious day made the first interstate Arbor Day a memorable event for all participants.

Larry Arnett, Deputy Commissioner of DNR presented the 2009 Kentucky ARRI Award to International Coal Group (ICG) East Kentucky, LLC, for their Peelpoplar facility located near Ransom in Pike County. ICG has become a strong advocate of FRA in their reclamation efforts. In 2008, they began collaborative work with the University of Kentucky in a research project to determine the implications for use of this reclamation approach on long, steep slopes. Accepting the award for ICG were Don Gibson, Roger Mason and Alan Ashley. According to Arnett, "The reforestation of Kentucky is of primary importance and a long-term goal of DNR. I am pleased with the on-going efforts of ICG, the University of Kentucky and the department in achieving progress with this goal."



Deputy Secretary Hank List and Deputy Commissioner Larry Arnett present the Arbor Day award to ICG East Kentucky for their reclamation efforts.

## Forestry Employee Receives Outstanding Service Forester Award

James Morris receives honor from the Kentucky Woodland Owners Association

Kentucky Division of Forestry (KDF) employee James Morris recently received the Outstanding Service Forester Award from the Kentucky Woodland Owners Association (KWOA). Morris, who works in the Green River District, has advanced forest management through his work with private landowners since 1995. He was selected by KWOA as the first recipient of the annual award based on his accomplishments over the past few years.

Since 2007, Morris has provided technical assistance to approximately 180 woodland owners, prepared 112 forest stewardship plans, and has inspected nine American Tree Farms for certification. As a service forester, he primarily works with private landowners who manage their woodlands using sustainable forestry practices. Morris' responsibilities also include marking timber for harvest and timber stand improvement, planting seedlings, conducting forestry education programs and fighting forest fires.

"James is highly respected and appreciated by landowners throughout the Green River District," said Henry Duncan, KWOA Vice President. "His knowledge of woodland management and cost-share programs has enabled landowners to better manage their woods for timber, wildlife habitat, watersheds and outdoor recreation."

Morris serves Christian, Logan, Todd and Webster counties and despite a demanding workload, he makes time to work cooperatively with other resource agencies including the Conservation Districts, County Extension, Department of Fish and Wildlife Resources, Natural Resource Conservation Services and Farm Services Agency.

KWOA is a non-profit membership organization founded in 1994 for the purpose of promoting the quality of our woodlands. The organization is controlled exclusively by independent Kentucky woodland owners whose goal is to help Kentucky forest landowners attain long-term value from their forestry operation while maintaining a healthy, beautiful forest.



KWOA Vice President Henry Duncan presents the Outstanding Service Forester Award

KDF is fortunate to have the dedication, experience and leadership of employees like Mr. Morris who provide an invaluable service to landowners and who play an important role in protecting the health of our forest lands.

### AML UPDATE

More than 180 households in Wolfe County will soon be able to turn on their tap and receive potable drinking water, thanks to a project funded by the Department for Natural Resources' Division of Abandoned Mine Lands (AML).

### MORE AML INFO????

## Kentucky Division of Forestry's Michael Froelich Named Tree Farm Inspector of the Year

Kentucky Forest Industries Association (KFIA) honors Forestry employee at 45th annual meeting

Michael Froelich was recently honored as the 2009 Kentucky Tree Farm Inspector of the Year at the Kentucky Forest Industries Association (KFIA) 45th Annual Meeting in Bowling Green, KY. Froelich is a service forester for the Kentucky Division of Forestry and has helped advance forest management through his work with private landowners and the Kentucky Tree Farm Program since 2007.

Froelich, who works in the Southeastern District, completed five new tree farm inspections and recertified two tree farms last year earning him recognition from the Kentucky Tree Farm Committee. Froelich conducted the inspections to ensure that sustainable forestry practices were being implemented by the landowners and to determine certification status for each farm. In order to become a certified Tree Farm and maintain certification, landowners must implement a management plan based on strict environmental standards and pass an initial inspection and subsequent inspections every five years.

Kentucky has over 800 certified tree farms owned by private landowners who manage their forests for a wide range of environmental, economic and social benefits. Tree Farmers share a unique commitment to protect wildlife habitat and watersheds soil, provide recreation for their communities while producing wood for America and these individuals hold the key to sustaining our forests.



Kentucky Tree Farm Committee Chair Robert L. Volk presents KDF Service Forester Michael Froelich with Inspector of the Year award.

The Kentucky Tree Farm Committee is sponsored by the Kentucky Forest Industries Association, a statewide association promoting the forest products industry of Kentucky since 1965, and the Kentucky Division of Forestry. The committee is an integral part of the American Tree Farm System promoting sound forest management through sustainable forestry.

For more information about the program or how you can become a certified Tree Farmer, contact Bob Bauer at 502-695-3979 or Pam Snyder at 1-502-564-4496. More information is also available online at <http://www.kytreefarm.org/> or <http://www.forestry.ky.gov/programs/stewardship/American+Tree+Farm+System.htm>.

### Mine Safety Initiative

**OMSL is currently working on a paperless mine safety analyst program up-loadable from the field the inspector's wireless notebook. When a job analysis is done, the miners information will be simultaneously matched with the Mine Safety Review Commission (MSRC) sanctions list to identify any miner that is working with a suspended or a revoked miner card. Follow-up will be done with the company and with the miner to ensure compliance with the decision of the MSRC.**



# Kentucky Mine Rescue Teams Hone Skills in Mine Emergency Drill

*Emergency drills vital to mine rescue preparedness*

The recent West Virginia mine explosion and rescue fresh in their minds, the Kentucky “signature” rescue teams had a renewed sense of urgency to prepare for potential mining disasters in Kentucky. The Office of Mine Safety and Licensing’s (OMSL) twelve mine rescue teams competed in a drill to fulfill the “contest” requirement mandated by the federal Miner Act. These contests are regularly scheduled throughout the year to continually hone and update the skills for Kentucky’s mine rescue teams.

OMSL teams were the only competitors in this drill, which began April 14th and continued through Thursday, April 15 at Jenny Wiley State Park near Prestonsburg, Kentucky. The teams are judged on their ability to safely handle dangerous scenarios and surprise situations that are simulated for the competition. These contests prepare OMSL mine rescue personnel with training in command center and mine rescue operations to improve their ability to effectively respond to major mining disasters that might occur.

The team members are safety inspectors, safety analysts or supervisors on a full time basis for the office and are generally familiar with the mines since they frequently inspect them. Teams waiting to compete are held in a large room, called “lock-up” for up to 6-8 hours, just as they would be after a disaster waiting for their turn to go into a mine. They arrive on the practice field outside not knowing the situation that exist. The team reports to the fresh air base and sets up communications between a briefing officer and the team. They are given maps of the mine and a scenario of the known situation inside the mine, and five minutes to review the situation before beginning. They enter the simulated mine and concentrate on improving ventilation, making bi-directional gas checks, testing the walls and roof for stability and building supports where necessary. They remove miners that are survivors, treat any who are seriously injured while simultaneously dealing with the other problems that arise.

All of this is done while attached to the “lifeline” which spaces the six men only six feet apart. In this exercise, they efficiently deal with the situations encountered, making sure to stay in order, attending to two live patients and their injuries and stay in constant communication with the briefing officer while identifying two casualties along the way.

The event is impressive to watch, seeing the 72 team members, 20 field judges, and another 20-30 more organizers in action. These guys are really tough men doing a tough job, who are very passionate about the business of mine rescue. They are competitive and strongly appeal every discount given to them by the impartial judges knowing that these discounts represent mistakes that could cost a life of a team member, or the entire team. After the two day exercise, the men felt they had brushed up on the skills needed and Madisonville Gray was selected as the best team this year.



Above: The Madisonville Grey team is entering the simulated mine. Below: Communications are a constant from the fresh air base.



# Legislative Update for the Department for Natural Resources

By Michael Mullins

The following legislative proposals became law during the 2010 session of the KY General Assembly:

## **HB 283** – Sponsor: Rep. Jim Gooch

The statutes that establish permit fees the Division of Mine Permits assesses on original applications, major and minor revisions, renewals, and transfers includes language that indicates permit fees shall bear a reasonable relationship to the cost of processing an application. These amounts have been capped at \$375 since 1982 and could not be changed without legislative action.

After several negotiations with the coal industry, an agreement was reached and House Bill 283 was introduced January 19. Through continued cooperation with the coal industry and the sponsor, Representative Jim Gooch, the bill became effective April 8 upon signature of the Governor. The bill increased amounts for all permit application types from a flat rate of \$375 per application to:

- \$2,500 for an original application;
- \$1,750 for a major revision or amendment; and
- \$750 for a minor revision, renewal or transfer

To ensure the Division of Mine Permits (DMP) benefited from the increased permit fees KRS 350.139 was amended to direct all amounts over the original \$375 be deposited into an account strictly for the use of the DMP. One-third of the original amount will continue to be transferred to the fiscal courts of the county in which the permitted operation is located.

## **HB 268** - Sponsor: Rep. Jim Gooch

In an attempt to decrease the number of fly rock incidents throughout the Commonwealth, the Division of Mine Reclamation and Enforcement (DMRE) proposed to increase the number of training hours required to renew a blaster license. This proposal increased the number of hours from 16 hours over a three year period to eight hours annually over a three year period. This is a net increase of eight hours and only allows four of those hours to be obtained from attending a conference unless otherwise approved by the department. This proposal was another joint effort by the cabinet and industry representatives and was sponsored by Representative Jim Gooch.

In the closing days of the legislative session the provisions of Senate Bill 63 were attached to HB 268. These provisions increased the amount of mining subsidence insurance from \$100,000 to \$300,000 per structure. This bill will take effect 90 days after Sine Die (July 14, 2010).

## **HB 215** – Sponsor: Rep. Jim Gooch

House Bill 215 was a bill originally filed by Representative Gooch in order to fix technical issues with a statute pertaining to nature preserves. With an agreement from industry and cabinet representatives, a provision to allow the DMRE to send Notices of Noncompliance and Cessation Orders via electronic certified mail was attached to HB 215. This proposal will significantly decrease the amount of money the division spends sending these documents out by standard certified mail. In addition, it will increase the speed at which these documents are delivered. This proposal will take effect July 14, 2010.



## First Lady Jane Beshear Holds Earth-day Event on Her Front Lawn

### Division of Forestry plays a role in earth day event held at the Executive mansion

On April 22nd, the First Lady, Jane Beshear planted a tree in the front lawn of the Executive mansion, in recognition of Earth day. The Valley Forge Elm was planted to replace a tree that had been severely damaged in last years ice storm. Mrs. Beshear hosted a class from Bridgeport elementary in Frankfort to help with the planting and to learn from the environmental event. Mrs. Beshear started the event by talking to the group about environmental issues. She touched on the three R's of environmental improvement, reduce, re-use, and recycle. On hand from the administration to assist with the educational event was Secretary of the Finance cabinet, Jonathan Miller, and Secretary of the Energy and Environment cabinet, Len Peters.

Following the tree planting, the children heard from Sara Gracey, from the Division of Forestry. Sara gave an educational talk about the importance of trees and presented each student with a redbud seedling grown in one of the Division's state-owned nurseries. She asked them to plant the tree and watch it grow over the next 20 years or so and be proud of what they have done for the earth. Sara took questions and answered them after the ceremony. To show her appreciation for the children and their participation, Mrs. Beshear gave each student a homemade cookie to enjoy on the bus ride back to the classroom. Photos by DNR staff.



Len Peters (left) Jane Beshear (middle) and Jonathan Miller (right) help students shovel in the soil at the Earth-day event.



## *Special Thanks*

A partnership between the Division of Forestry, the Division of Conservation, and the conservation districts have once again ensured a successful 09-10 tree planting season. As a result of your efforts, 96 of the 121 conservation districts in the state purchased tree seedlings through the division. Most all also took advantage of the division's offer to match a portion of seedlings purchased with white pine seedlings.

In all, 146,570 seedlings were bought and the division provided 102,580 matching seedlings for a total of 249,150 seedlings distributed and planted.

Thank you, the Division of Conservation, Forestry, and all the Conservation Districts for making this partnership such a success.

# Environmental Quality Commission honors 10 Individuals, Groups with Earth Day Awards

*Recognized for significant contributions to the environment*

FRANKFORT, Ky. (April 16, 2010) – The Kentucky Environmental Quality Commission celebrated the 40th anniversary of Earth Day today with its annual awards ceremony at Berry Hill Mansion in Frankfort. Environmental Protection Agency Region 4 Administrator Stan Meiburg, the keynote speaker, told the crowd of nearly 100 that environmental protection efforts can spur the economy. "Well conceived, effectively implemented environmental protection is good for economic growth. We all want a clean environment and we all want a strong economy," he said.

The 2010 Earth Day Award recipients partnering with DNR are:

**Campbell County Conservation District** was recognized for its land conservation efforts. The district, through the formation of a farmland work group committee, conducted a 'Cost of Community Services' study, an agriculture industry profile and a farmer survey, the results of which launched the district's efforts to promote agriculture land conservation. The district also was applauded for its partnerships with other organizations across northern Kentucky.

**Millie and Frank Anderson** operate a 125-acre farm in Shelby County with 20 head of cattle and 18 head of sheep. The Andersons renovated their pastures, practice rotational grazing to reduce erosion in their creeks and follow a nutrient and pest management plan. They have installed fencing to keep their livestock out of the creeks on their farm. They've also installed pipeline and tanks so that the cattle and sheep have an alternative source of water. To repair a heavily used area of land, they installed a livestock trail and walkway and diversion ditches to protect the area from overland surface flow of water.

**Save Kentucky's Hemlocks** is a partnership of citizens, nonprofits and government agencies working together to save eastern hemlocks from the impacts of Hemlock Woolly Adelgid (HWA). Save Kentucky's Hemlocks has raised public awareness, provided outreach, organized fundraising efforts and efficiently allocated resources so that combating HWA in Kentucky can be swift and effective. To date, more than 15,000 trees have been treated in some of Kentucky's most pristine hemlock forests. The group has organized demonstrations and trainings for public land managers, concerned citizens, and volunteer groups working to minimize the spread of HWA through detection and treatment. The partnership includes the following Kentucky agencies: Natural Lands Trust; Mountain Association for Community Economic Development; State Nature Preserves Commission; Department of Fish and Wildlife Resources; Division of Forestry; The Nature Conservancy; Kentucky Department of Parks; Kentucky Division of Water; Soil Conservation District; University of Kentucky Cooperative Extension Service; and the Pine Mountain Settlement School.

**A.L. Sinclair** of Adair County works tirelessly to improve his community's environment. In addition to starting a recycling program, Sinclair has spearheaded a roadside cleanup program and an effort to remove decades of accumulated trash in sinkholes throughout the county. His latest effort will improve the quality of groundwater in Adair County.

**Sandy Whitaker** of the Rockcastle County Conservation District, who has been called 'the main force' behind the district's accomplishments.

One nomination so far (OMSL)



## Spring Forest Fire Hazard Season Ended April 30

### *Busy Season Has Forestry Officials Concerned*

**May 3, 2010)** – Forest fires have kept the Kentucky Division of Forestry busy this spring. Although the spring forest fire hazard season officially ended on April 30, the potential for wildfires can occur any time of year. This potential has forestry officials concerned as reduced staff and other cutbacks hinder the ability to suppress wildfires and ensure public safety.

Since January, 928 fires have burned approximately 32,404 acres in the state, most of which occurred during the driest period from April 1 – 21 with 551 fires burning 28,439 acres. At this time last year, wildfires had burned 29,491 acres and in 2008, wildfires had burned only 17,449 acres by the end of April.

Over 60 percent of forest fires in Kentucky are intentionally set. Last year, fires started by arsonists burned nearly 33,000 acres. Citizens who witness suspected arson activity are asked to call the nearest Kentucky State Police post or the Target Arson Hotline at 1-800-27-ARSON. They can also call the nearest district office of the Kentucky Division of Forestry.

Outdoor burning can also lead to forest fires. Before conducting any outdoor burning, citizens are advised to be familiar with the applicable regulations. Citizens should contact the Division for Air Quality, the Division of Waste Management, as well as the Division of Forestry and local government officials to ensure that they are complying with all outdoor burning laws.

To reduce the risk of wildfire caused by outdoor burning, the division recommends the following guidelines:

- Clear a safe zone that is wide enough to prevent the escape of fire;
- Keep a supply of water and a rake or shovel readily accessible;
- Do not leave a fire unattended;
- Burn only when the wind is calm and the humidity level is high;
- Extinguish fire completely if conditions become windy;
- Keep burn piles small to allow quick control of the fire if necessary; and
- Locate burn piles an adequate distance from structures and utilities.

For more information about fire hazard seasons, outdoor burning laws and safe burning practices, visit the Division of Forestry's Web site at <http://www.forestry.ky.gov/>.

# What is Non-coal Mining in Kentucky?

Natural Resources Department issues permits and inspects all mining and blasting in the state  
Jim McKenzie

The Non-coal Branch regulates the surface mining of all non-coal minerals in the state of Kentucky. The surface mining disturbance of non-coal minerals are limestone, dolomite, sand, gravel, clay, fluorspar, rock asphalt, surface disturbance of dredging river or creek sand or gravel and other vein minerals. In addition, the non-coal branch regulates the surface disturbance of oil shale mining. There are currently 234 permitted non-coal sites across the state covering 47,000 acres.

The most common non-coal minerals mined in Kentucky are limestone, sand, and gravel. Unlike a surface coal mine, which may have mining completed within a couple of years in a specific area, a non coal mine such as limestone will typically be in operation for as many as 50 to 75 years or more. A limestone mine will generally be mined in benches as they work their way down through the limestone creating a pit. In some areas, once a highwall is established, the company may choose to mine the area underground. In almost all cases in underground limestone mining, the roof is solid and does not create roof fall or subsidence problems. Once mining has been completed in limestone, the pit fills with water and the area can be used for recreational purposes. Some are used for pay lakes or boating recreation. Some limestone pits have been used for scuba diving activities due to the clear water in the pit. In some cases, mined out deep mines can be used for storage areas and even offices .

Sand and gravel mines, more prevalent in western Kentucky than in eastern Kentucky, are typically smaller mines than limestone mines. These mines do not require any blasting to remove the overburden. After topsoil removal, the sand and gravel are scooped up and processed through a screen which separates the different size aggregates for distribution. Once a sand and gravel operation is completed, the area will be graded, covered with topsoil and seeded for hay and pastureland .

Non-coal permits are inspected for compliance on an average of every four to six weeks.



Limestone mining using the bench method



Reclamation of a limestone pit provides recreation and habitat



Reclamation of post-mined land



## Division of Forestry Extends a Helping Hand to Melcalfe County after Flooding Clearing roads



Report from Brian Yager, district forester, Campbellsville indicates our employees (Ricky Parnell and Kenneth Pyles) made good progress yesterday and will be working again today. A resident commented to Yager yesterday that it would have taken the county a week or better to get them out had we not assisted. The road was completely washed out on one end and flooded on the other. It passes under the parkway and the underpass was washed out waist deep on one end and required several trucks of fill rock. May 5th & 6th

County Judge Executive Greg Wilson was appreciative. Quote??



## Blasting – A Citizen's Guide

Ralph King, Division of Mine Reclamation and Enforcement  
Explosives and Blasting Branch

**Why do companies blast?** Earth moving equipment cannot break up all the natural bedrock in Kentucky. Explosives are used in construction, quarrying, and mining to fragment rock layers so that the mechanized equipment can move it. Blasting operations include trench blasting to install utility lines, fracturing limestone used for roads, and fragmenting overburden when mining coal. Small amounts of explosives are used in demolition of buildings and in some cases when installing utility poles. The Explosives and Blasting Branch licenses all blasters and issues all permits for explosives purchases and storage facilities. In addition, they inspect and regulate all blasting operations state-wide. Citizens close to these operations can request inspections at any time and they do.

**What causes a house to shake?** Although proper design controls the adverse effects from the use of explosives outside the blast area, people can feel the effects of blasting operations. It is understandable to be concerned about blasting when your home is shaking. When explosives are detonated in rock, two things happen: a shock wave is produced and gas pressure is formed. The shock wave creates micro fractures around the blast hole - limited to a few diameters of the blast hole, but generally 30 feet or less. As the gas expands into these fractures, the rock breaks. In fact, the gas pressure is what physically fragments the rock. Each blast is designed to consume the energy produced by the explosives in the breaking of the rock. However, a small amount of energy will radiate away from the blast site.

The ground movement that one feels is from the shock wave, while the venting of the expanding gas and movement of the air caused by the displaced material will create a slight air overpressure. What you “feel” inside the house is a combination of both effects. Ground vibrations travel through the earth at several thousands of feet per-second, while the effects to the atmosphere move at approximately the speed of sound. How your house will respond depends on several factors that are related to the type of blasting operation, distance to your property, and the weather. For example, blasting a trench for a sewer line up the middle of a street in front of a house will create a high frequency shock wave and very little air overpressure. The vibrations pass very quickly. On the other hand, one’s house will respond noticeably longer from blasting on a surface coal mine because greater volumes of material must be moved requiring larger blast designs than those needed for the trench. Often blasts are hundreds of feet away, and the ground movement begins to slow its rate of travel due to the distance. Even when farther away, the ground vibration will reach your property before the air overpressure, so that your home might respond for several seconds. The condition of the atmosphere may cause the air overpressure to produce different effects from similar blasts. On a clear day, the pressure is dissipated vertically, but low clouds will cause the air wave to reflect and it may cause a structure to respond at a greater distance. A low level change in air pressure can cause windows to rattle, an effect similar to a clap of thunder.

**If my house shakes, it must have damage!** Much research has been done in order to determine the extent of damage that can be expected from blasting vibrations. The United States Bureau of Mines (USMB) performed thorough research on the effects of coalmine blasting on residential structures. These studies involved mounting seismographs inside homes adjacent to a mine site and making observations during the blasting. The seismograph measures Peak Particle Velocity (PPV) of the ground vibrations and records the rise in air pressure exceeding ambient conditions. Three parameters are important in monitoring a blast: PPV, analogous to speed limit pounds per square inch (PSI) – units used to measure air overpressure decibels (dB). As the blasting vibration excites a particle, it moves about its point at rest in three dimensions, not in a straight line. The seismograph measures the rate of the movement in three separate planes to determine the velocity of the vibration. Other studies involved different types of blasts such as construction and quarry blasting operations. Mechanical shakers were installed in a test home to determine the actual effects of repeated vibrations. Results from this study indicate that damage did not occur from repeated vibrations.

## Blasting – A Citizen's Guide– Continued...

Ralph King, Division of Mine Reclamation and Enforcement  
Explosives and Blasting Branch

**How is blasting regulated?** The USMB's reports combined with recommendations from other research studies provide the basis for current regulations. Kentucky's laws and regulations restrict ground movement and air overpressure to specific limits depending on the type of blasting operation. Construction and quarry blasting is limited to ground movement of 2 PPV and air overpressure is limited to 133 dB. These differ from those on coal mining operations, which limit ground movements from .75 PPV to 1.25 PPV depending on distance from the blast. On coalmines, compliance may involve a combination of PPV and the frequency (Hz) of the ground movement. Air overpressure from coal mine blasts is limited to 133 dB at 6Hz. Records are kept on explosives from manufacture to end-use. Cross checking the records allows the E&B branch to ensure that all explosives are accounted for, making it difficult to falsify shot reports.

When the E&B inspector documents a violation, a citation and/or a notice of non compliance is written to the blaster and/or the company performing the work. Liability insurance is required for all blasting operations in Kentucky. Settlement of the monetary amount of damage claims is a civil matter.



Holes are accurately located and carefully drilled for a trench line blast. These two operators are drilling holes for sewer line in Madison County



# Kentucky Envirothon Competition Tests Students Environmental Knowledge

Fayette County wins state competition held in May at Kentucky Leadership Center

Fayette County won the 2010 edition of the Kentucky Envirothon. The Kentucky Envirothon competition was held May 20-21. The competition began with 40 teams from across the state contending for the top five spots from each of the two regional competitions. The regional competitions were held in April at the Baker Natural Area and Morehead State University Farm. The students were tested in five areas: soils, aquatics, forestry, wildlife, and a current issue which was "Protection of Groundwater through Urban, Agricultural and Environmental Planning." During the state competition, students were also judged on an oral presentation based on a scenario dealing with the current issue.

Finishing behind Fayette County, the second and third place teams were duPont Manual in Louisville and Southwestern High School in Somerset. Fayette County won the site competition in the oral competition, soils, wildlife, and current issue. duPont Manual won the forestry and aquatics site. Also competing in the state contest were teams from Oldham County, Todd County, Apollo in Owensboro, Logan County, and Daviess County.

"This year's state contest was very competitive and the close competition demonstrated the hard work of each of the state teams" according to Division of Conservation Director Steve Coleman. "This tough state contest will prepare Kentucky's winning team to finish in the top level at the national contest and we wish Fayette County great success at the Cannon Envirothon in Fresno, CA in August, 2010."

Envirothon is a competitive, problem-solving, natural resources experience for students in grades 9 through 12. The event is competitive, but education is the bottom line. With the support of natural resource professionals, students are trained in the ways that real life environmental problems are solved.

Teams of five students work to solve environmental problems. These teams are tested on their knowledge of Kentucky's natural resources at five "in the field" test stations.

Each station covers a separate topic addressing soils, forestry, wildlife, aquatics and a current environmental issue. Through hands-on experiments, analysis and use of critical thinking skills, the teams answer a set of questions at each station.

Sponsors of the Kentucky Envirothon are: Kentucky Association of Conservation Districts, Kentucky Farm Bureau, Kentucky Department of Agriculture, Farm Credit Services, Kentucky Department of Fish and Wildlife Resources, Kentucky Association of Conservation Districts' Auxiliary, several local conservation districts. Others that assisted with the competition: Kentucky Division of Forestry, Kentucky Division of Water, and the Kentucky Division of Conservation.



Winning team Fayette County from left to right: Becca Fleischman, Darshali Vyas, Arlene Wang, Ranajay Sen, and Alex Fleischman.



Southwestern Team working at the soils site



## Contact Page

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**Evan Satterwhite.....502-564-6940**  
[Evan.Satterwhite@ky.gov](mailto:Evan.Satterwhite@ky.gov)

**Linda Potter.....502-564-6940**  
[Linda.Potter@ky.gov](mailto:Linda.Potter@ky.gov)

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Photo by  
J. Hamon